Exercise 1 *For each of the following functions, find two simpler functions f and g such that the given function can be written as a composite function $g \circ f$. The functions f and g should each be a famous function or a polynomial.*

- *If* $g(f(x)) = \sin(x^2)$, *then we could decompose this function into* $g(x) =$ $\boxed{\sin(x)}$ *and* $f(x) = \boxed{x^2}$.
- *If* $g(f(x)) = \sqrt{2x^5 - 7}$, *then we could decompose this function into* $g(x) =$ $\boxed{\sqrt{x}}$ *and* $f(x) = \boxed{2x^5 - 7}$.
- *If* $g(f(x)) = e^{3x-x^2}$, *then we could decompose this function into* $g(x) =$ $\boxed{e^x}$ *and* $f(x) = \boxed{3x - x^2}$.
- *If* $g(f(x)) = |\ln(x)|$, *then we could decompose this function into* $g(x) =$ $\boxed{|x|}$ *and* $f(x) = \boxed{\ln(x)}$.
- *If* $g(f(x)) = 5e^{4x} + 7e^{3x} - 11e^x + 4$, *then we could decompose this function into* $g(x) = \boxed{5x^4 + 7x^3 - 11x + 4}$ *and* $f(x) = \boxed{e^x}$.